THE 1997-98 HARVEST OF MOOSE, CARIBOU, AND BEAR IN MIDDLE YUKON AND KOYUKUK RIVER COMMUNITIES, ALASKA

by

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ABSTRACT

This report documents the harvests of moose, caribou, black bear, and brown bear for the year April 1997-March 1998 in 10 communities along the middle Yukon and Koyukuk rivers in Alaska. The report presents information on the harvest, use, and sharing of big game resources, including the number of animals harvested and the sex, location, and month of harvest, with confidence intervals around the harvest estimate. The information is presented at the community and regional levels. The research was conducted by the Alaska Department of Fish and Game, Division of Subsistence, with hunter surveys administered by locally-hired research assistants. The project received formal approval by the tribal or municipal governments of each surveyed community. Funding for the study derived from the federal Pitman-Robertson Program and state general funds.

The project succeeded in meeting project objectives in all 10 communities. A total of 467 of 682 area households (68.5%) were successfully surveyed. Estimated harvests by residents of the study communities during the study year included 444 moose, 141 caribou, and 68 black bear. There was no measurable harvest or use of brown bear. Estimated moose harvests from the household survey (444 moose) were substantially greater than estimated harvests from the state permit and harvest ticket system for the same communities and harvest period (190 moose). Survey findings demonstrate the importance of moose as a food resource in the middle Yukon and Koyukuk rivers area.

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INTRODUCTION

This report documents the harvests of moose, caribou, black bear, and brown bear for the year April 1997-March 1998 in 10 communities along the middle Yukon and Koyukuk rivers in Alaska. The report presents the number of animals harvested and the sex, location, and month of harvest, with confidence intervals around the harvest estimate. The information is presented at the community and regional levels, and compared with harvests documented in five middle Yukon communities for the previous year (April 1996-March 1997). The research was conducted by the Division of Subsistence of the Alaska Department of Fish and Game, with hunter surveys administered by locally-hired research assistants. The project received formal approval by the tribal or municipal governments of each surveyed community. Funding for the study derived from the federal Pitman-Robertson Program and state general funds.

Accurate harvest estimates are a basic data need for the proper management of game populations, as they measure removals by directed takes from game populations. In Alaska, these data are important for documenting baseline levels of subsistence harvest and subsistence use patterns as required under the state subsistence statute (Alaska Statute 16.05.258). They also can be used for quantifying the severity of subsistence food shortages and to guide management policy decisions as game populations and hunting pressure fluctuate.

Recent studies in Alaska have shown that harvest ticket systems for reporting big game harvests may substantially underestimate harvests of big game taken by hunters residing in Alaska's rural communities. A recent survey on the Alaska Peninsula, for example, found that the state harvest permit system accounted for just 40 percent of the moose harvested by hunters residing in 12 study communities in 1994-95 (Kreig et al. 1996). Andersen and Alexander (1992) found similar low estimates for the interior communities of Fort Yukon,

McGrath, and Nulato, and concluded that: 1) some rural hunters harvest without ever obtaining a harvest permit, 2) hunters that do obtain harvest permits sometimes fail to return the harvest report, and 3) returned harvest reports sometimes account for only a portion of a hunter's actual harvest, particularly for hunters who take moose for sharing with other households.

An alternative means used by the department for making harvest estimates in rural communities has been through retrospective household interviews with hunters. Subsistence data collected using this methodology have consistently resulted in harvest estimates that are more precise and typically higher than those provided by harvest ticket returns. Key to the success of this methodology are that high response rates may be achieved, survey questions can be tailored to address the variability in local hunting patterns, and the identity of individual hunters remains confidential.

In recent years, the Division of Subsistence has refined its harvest survey procedures and has found that it is often beneficial to incorporate locally-hired research assistants into the data collection process. Locally-hired research assistants bring with them knowledge of their community, language, hunting patterns, and customs. Hunters often feel more comfortable talking to someone they know rather than a stranger. Communities also like this methodology because it involves them more directly in the data collection process and creates local employment opportunities. This methodology has been used successfully by the division for the past 5 years to collect marine mammal harvest data in over 60 coastal communities throughout Alaska (Wolfe and Mishler 1996) and to collect information on migratory bird harvests in northwest Alaska (Paige et al. 1996).

In spring of 1997 the division initiated a pilot project to test the practicality of using locally-hired research assistants to collect big game harvest data through household surveys in five rural

interior Alaska communities. The project succeeded in collecting a one-year set of harvest information for moose, caribou, black bear, and brown bear in the middle Yukon River communities of Galena, Kaltag, Nulato, Ruby and Tanana. In addition to documenting subsistence uses and harvest levels of these species, the 1997 pilot project served to test a one-page big game harvest survey instrument and provided insight on numerous aspects of the research process such as the selection and training of local research assistants, practical survey workloads, sampling strategies, time requirements to complete surveys, and development of data entry and analysis procedures. The 1998 big game harvest assessment project emerged as an expansion of the successful 1997 pilot project and used substantially the same survey instrument and procedures. The 1997 and 1998 harvest data sets are compared in a later section of this report.

Specific objectives of the 1998 big game harvest assessment project included: 1) accurate estimates of moose, caribou, and bear harvests with confidence ranges for each of the survey communities, 2) documentation of subsistence use patterns for moose, caribou, and bear, 3) information on the geographic location of big game harvests, 4) involvement of local residents in the collection of subsistence information, and 5) development of local expertise in harvest surveying for future projects.

METHODOLOGY

Survey Communities

The middle Yukon and Koyukuk River communities of Alatna, Allakaket, Bettles, Evansville, Galena, Hughes, Huslia, Kaltag, Koyukuk, Nulato, Ruby, and Tanana were selected as potential survey communities for this project. As a group, they represent a mix of small- to medium-sized, rural interior Alaska communities. They share the distinction of being situated off the road system and are located within game management units 21D and 24 with the exception of Ruby

and Tanana, which are located in GMUs 21B and 20F respectively. Figure 1 shows the location of survey communities and area game management units. Large game populations in this area, particularly moose, are thought to be generally healthy and relatively abundant, and the area has some of the least restrictive hunting regulations in the state. Area hunting regulations for big game species are reviewed in Appendix C.

As mentioned above, five of the survey communities, Galena, Kaltag, Nulato, Ruby, and Tanana had been successfully surveyed during the 1997 pilot project and were included in the 1998 survey effort in order to obtain a second year of data. In addition to the 1997 pilot project work, the division had conducted previous subsistence baseline studies in Galena (Marcotte 1990), Tanana (Case and Halpin 1990), Huslia (Marcotte 1986), and in the Upper Koyukuk communities of Alatna, Allakaket, Bettles, Evansville, and Hughes (Marcotte and Haynes 1985). These baseline works provide comprehensive background information on the harvest and use of wild resources by residents of these communities and serve as a basis for comparison with results from this study.

It should be noted that Bettles and Evansville are small neighboring communities located in the vicinity of the Bettles Field Post Office and airstrip. Each community has strived to maintain its own identity through the establishment of separate governing councils and were therefore distinguished as separate communities for purposes of this survey. Likewise, Alatna and Allakaket are located across the Koyukuk River from each other and while they share close social and economic ties, they maintain separate village council systems and were treated as individual communities for the purposes of this survey.

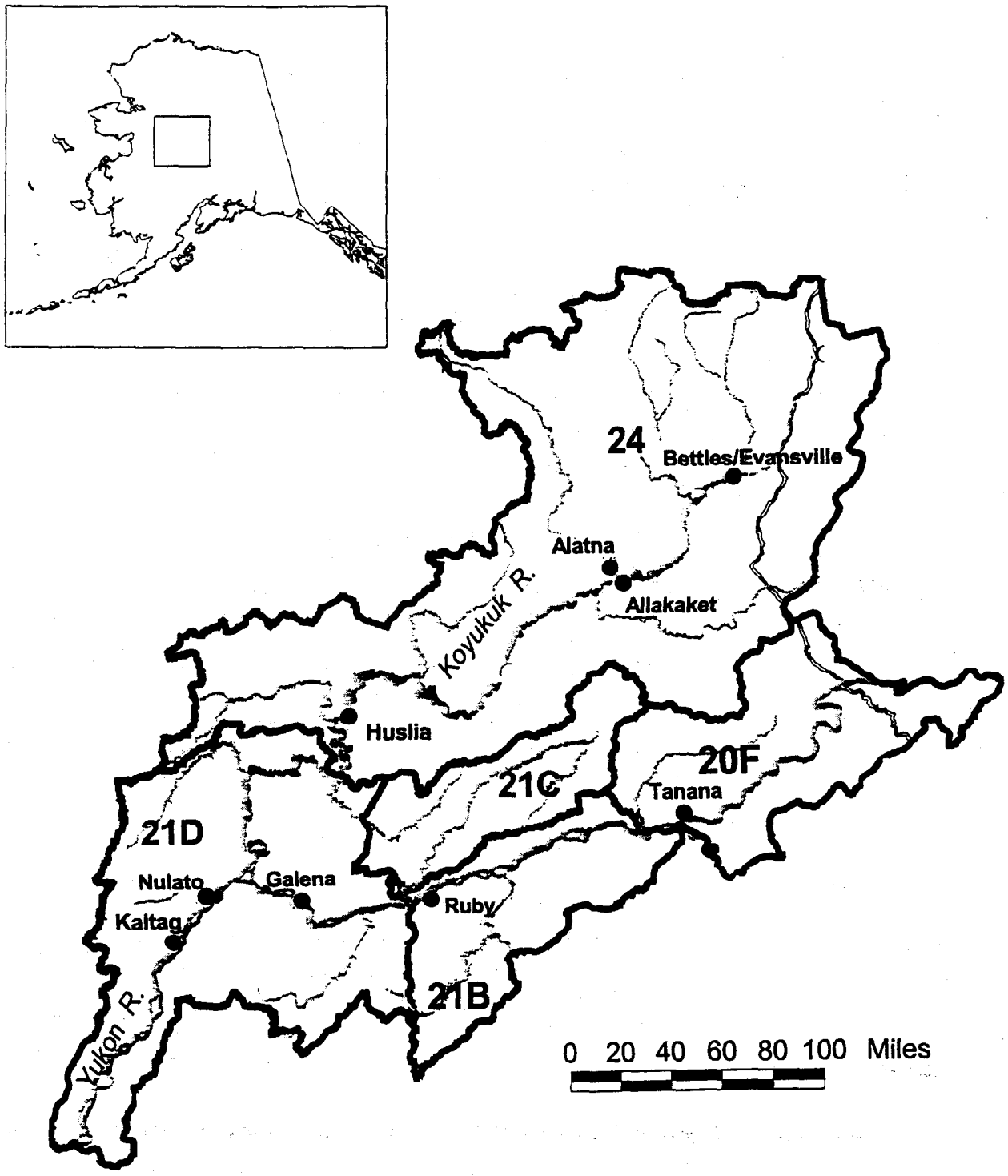


Figure 1. The middle Yukon and Koyukuk River area showing survey communities and game management units.

Procedures

Following standard Division of Subsistence procedures, community approval of the project was sought from the local tribal, village, or city council prior to beginning work in each community. This approval process took place during the months of February and March 1998. The project was approved by the councils in all 12 survey communities.

Following project approval, local councils were asked to recommend a local resident to serve as a local research assistant. Qualifications and job specifications for the Fish and Wildlife Technician II job class were provided to the councils by the project coordinator and served as the basis for their recommendation. In addition to the minimum job class requirements, councils were asked to recommend someone who was familiar with local hunting practices and customs and who would be welcome and comfortable visiting with all households in the community. Some councils simply recommended an individual, others posted recruitment announcements and screened interested applicants in order to arrive at their recommendation.

During the month of April 1998, technicians were successfully recruited as project assistants to conduct survey work in 10 of the 12 survey communities. The communities of Koyukuk and Hughes were unable to meet project deadlines for identifying individuals to fill the research assistant position and were subsequently dropped from the list of 1998 survey communities. Given the small size of Alatna (11 households) and it's proximity to Allakaket, a single research assistant was hired to survey both communities. Likewise, one individual was hired to carry out project work in the neighboring communities of Bettles and Evansville. Thus a total of 8 technicians were employed in the 10 survey communities. The project coordinator traveled to each survey community to meet personally with each technician, complete hiring paperwork, conduct an orientation session, and provide survey materials and instructions.

Surveys took place during the months of April and May 1998. Big game harvest data were collected using a one-page survey instrument (Appendix A) administered during face-to-face interviews with household heads in each sampled household. Game species asked about on the survey included moose, caribou, black bear, and brown bear. The harvest period asked about on the survey was the 12-month period April 1997 through March 1998. In addition to harvest numbers, the survey included questions about use and sharing of resources, and the sex, month of harvest, and kill location of harvested animals. Harvest locations were recorded by showing successful hunters a map of the middle Yukon River region with ADF&G uniform coding units (UCUs) and asking them to identify the UCU in which the harvest took place. A map showing the location of area UCUs is included as Appendix B.

Completed survey forms underwent several reviews. Surveyors were asked to review forms for basic completeness prior to sending them to the project coordinator. The project coordinator then reviewed completed forms for omissions, illegible entries, and logic errors. Problem forms were returned to the surveyors for resolution. Reviewed and repaired forms were sent to the Division of Subsistence data management program where a double-entry system was used to enter information into a computerized system for analysis.

Sample Design and Analysis

Households were selected for surveying using two sampling designs depending on the size of the community-- census sampling for communities with fewer than 70 households, and random sampling for larger communities. The type of design used for each community is shown in Table 1. A total of 467 of 682 households were surveyed (68.5 percent). For communities with census sampling, 85.9 percent of identified households (195 of 227 households) were successfully contacted and interviewed. For communities with random selection designs, 59.8 percent of households (272 of 455 households) were successfully contacted and interviewed.

Table 1. Survey design and samples.

Community	Type of Design	Total Number of Households	Number of Surveyed Households	Percent of Households Sampled	Unable to Contact	Declined Survey	Sampled Household Population	Estimated Community Population
Alatna	Census	11	11	100.0%	0	0	25	25
Allakaket	Census	55	52	94.5%	2	1	166	175.58
Bettles	Census	9	7	77.8%	2	0	18	23.14
Evansville	Census	18	14	77.8%	3	1	34	43.71
Galena	Random	183	95	51.9%	8	1	278	535.52
Huslia	Random	78	58	74.4%	2	0	162	217.86
Kaltag	Census	62	45	72.6%	16	1	179	246.62
Nulato	Random	86	55	64.0%	6	0	199	311.16
Ruby	Census	72	66	91.7%	4	2	202	220.36
Tanana	Random	108	64	59.3%	7	0	175	295.31
All Communities		**682**	**467**	**68.5%**	**50**	**6**	**1438**	**2094.26**

These are high sampling fractions for studies using survey methodologies which rely upon the voluntary participation by surveyed households. Overall, the level of cooperation by households in the harvest survey was high. Of the 523 households that surveyors attempt to contact, only six households declined to participate in the survey. Fifty of the 523 households could not be contacted during the survey period, thus, the non-response rate was primarily due to logistical problems in contacting households rather than refusals to participate.

In analysis, harvests of surveyed households were expanded to unsurveyed households. The expansion treated each community as a separate sampling universe. The mean harvest of surveyed households were assigned to unsurveyed households in each community. Fractions of animals commonly resulted from the expansion, which were rounded to the nearest tenth. The tables in the report present expanded estimates. The calculation of confidence ranges around the harvest estimate followed methods in Cochran (1977:5.13, 5.15). In this process, the unexpanded, reported take was used as the lower confidence interval if it was higher than the statistically-calculated lower harvest estimate. This was done because the unexpanded harvest represents known (not hypothetical) kills.

Survey data resulted in a population estimate of 2,094 people residing in the 10 survey communities. These communities ranged in size from 536 people residing in Galena to 23 people residing in Bettles.

FINDINGS

Moose

Local Moose Harvest and Use

Survey results presented in Table 2 show that moose meat is an important resource used by nearly all households. Overall, 91.2 percent of all households in the middle Yukon area used moose, ranging from a low of 28.6 percent in Bettles to a high of 100 percent using moose in Alatna and Huslia. Two-thirds (67.2 percent) of all households attempted to harvest moose and nearly one-half (48.2 percent) of all households were successful in harvesting one or more moose. The overall success rate for moose hunting households was 71.7 percent. Moose harvest rates were lowest in Bettles where no hunters reported harvesting a moose, and highest in Nulato where 61.8 percent of the households harvested moose for a success rate of 83.0 percent. All moose hunting households in Kaltag were successful.

Moose meat is commonly shared between households and between communities. This pattern of sharing accounts for the high percentages of households using moose (91.2 percent) relative to those harvesting moose (48.2 percent). In Alatna and Huslia, for example, where 100 percent of households used moose, 45.5 percent of Alatna households and 56.9 percent of Huslia households harvested moose. Sharing between communities accounts for the finding in Bettles where surveyed households harvested no moose, but more than one-quarter (28.6 percent) reported using moose. Percentages of households receiving moose meat from other households averaged 57.8 percent overall and ranged from 28.6 percent in Bettles to 63.6 percent in Alatna. Percentages of households giving moose meat to other households averaged 42.5 percent overall and ranged from 14.3 percent in Bettles to 59.6 percent in Allakaket.

Table 2. Levels of participation in the use and harvest of moose, April 1997 - March 1998.

	Participation of Households					Estimated Harvest Levels						Estimated Hunter Information				
									95% Confidence Limit of Total Harvest			Total			Successful	
Community	Use (%)	Att (%)	Hrv (%)	Rec (%)	Gav (%)	Total	Per Household	Per Person	%	Low	High	Number	% of Population	Harvest/ Hunter	Number	Harvest/ Hunter
All	91.2	67.2	48.2	57.8	42.5	444.4	0.65	0.21	6.5	415.5	473.3	738.5	35.3	0.60	402.0	1.11
Alatna	100.0	81.8	45.5	63.6	45.5	9.0	0.82	0.36		9.0	9.0	15.0	60.0	0.60	8.0	1.13
Allakaket	98.1	76.9	53.8	59.6	59.6	43.4	0.79	0.25	8.1	41.0	46.9	70.9	40.4	0.61	34.9	1.24
Bettles	28.6	14.3	0.0	28.6	14.3	0.0	0.00	0.00	0.0	0.0	0.0	3.9	16.7	0.00	0.0	0.00
Evansville	50.0	35.7	7.1	50.0	42.9	2.6	0.14	0.06	101.8	2.0	5.2	10.3	23.5	0.25	2.6	1.00
Galena	87.4	68.4	55.8	50.5	54.7	131.0	0.72	0.24	14.6	111.9	150.1	210.0	39.2	0.62	131.0	1.00
Huslia	100.0	65.5	56.9	50.0	32.8	80.7	1.03	0.37	17.0	66.9	94.4	74.0	34.0	1.09	53.8	1.50
Kaltag	95.6	48.9	48.9	75.6	44.4	40.0	0.64	0.16	18.9	32.4	47.5	62.0	25.1	0.64	37.2	1.07
Nulato	94.5	74.5	61.8	50.9	38.2	67.2	0.78	0.22	16.3	56.3	78.2	103.2	33.2	0.65	65.7	1.02
Ruby	98.5	80.3	37.9	69.7	30.3	28.4	0.39	0.13	9.4	26.0	31.0	79.6	36.1	0.36	28.4	1.00
Tanana	89.1	65.6	32.8	65.6	32.8	42.2	0.39	0.14	24.8	31.7	52.6	109.7	37.1	0.38	40.5	1.04

An estimated 444 moose (with a confidence range between 415 and 473 moose) were harvested by hunters from the 10 survey communities. Harvest levels averaged about two-thirds of a moose (0.65 moose) per household overall and varied from a high of 1.03 moose per household in Huslia to a low of 0.0 to 0.14 moose per household in Bettles and Evansville. An estimated 738 people residing in the 10 survey communities hunted moose, or 35.3 percent of the area population.

Using a conversion factor of 540 pounds of meat per moose, the estimated harvest of 444 moose provided 239,760 pounds of meat for use by area residents, or about 115 pounds per person. In Huslia, moose harvests provided 200 pounds of moose per capita, placing that community among the top moose harvesting communities in the state for which the Division of Subsistence has collected harvest information (ADF&G 1998).

Sex and Timing of Moose Harvests

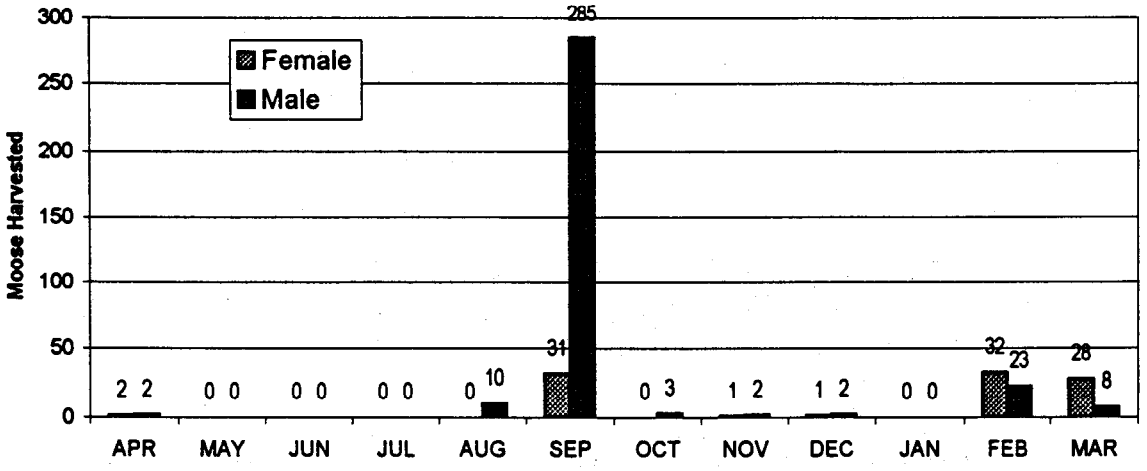
Table 3 and Figure 2 show the estimated moose harvest by sex and month. Of the 437 moose harvested for which sex information was given, 333 (76 percent) were bulls, and 104 (24 percent) were cows. Sex was not reported for 7 moose, or 1.6 percent of the harvest.

For the reporting period, April 1997 through March 1998, moose were harvested in all calendar months except May, June, July, and January. There are two major moose hunting periods--a fall harvest occurring predominantly in September, and a spring harvest, taking place during February and March. Of the 444 moose taken, 317 (71.4 percent) were harvested during the month of September. The September harvest consisted of 285 bulls (90 percent) and 31 cows (10 percent). The February/March harvest of moose consisted of 94 animals or 21.2 percent of the annual harvest. Of these, 60 (64 percent) were cows, 30 (32 percent) were bulls, and the sex was not reported for 4 moose. The remaining 7.4 percent of the annual moose harvest

Table 3. Estimated harvest of moose by sex and month, April 1997 - March 1998.

Community	Sex	April	May	June	July	August	September	October	November	December	January	February	March	Unknown	Total
All	All	12.6	0.0	0.0	0.0	9.9	317.4	2.8	2.7	3.7	0.0	57.6	36.3	1.4	444.4
	Female	10.5	0.0	0.0	0.0	0.0	31.3	0.0	1.1	1.3	0.0	32.2	27.7	0.0	104.1
	Male	2.1	0.0	0.0	0.0	9.9	284.7	2.8	1.7	2.4	0.0	22.5	7.5	0.0	333.4
	Unknown	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	3.0	1.1	1.4	6.8
Alatna	All	1.0	0.0	0.0	0.0	2.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	9.0
	Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0
	Male	1.0	0.0	0.0	0.0	2.0	3.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	7.0
	Unknown														
Allakaket	All	2.1	0.0	0.0	0.0	3.2	28.6	0.0	1.1	1.1	0.0	0.0	7.4	0.0	43.4
	Female	1.1	0.0	0.0	0.0	0.0	1.1	0.0	1.1	0.0	0.0	0.0	4.2	0.0	7.4
	Male	1.1	0.0	0.0	0.0	3.2	27.5	0.0	0.0	1.1	0.0	0.0	2.1	0.0	34.9
	Unknown	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	1.1
Bettles	All														
	Female														
	Male														
	Unknown														
Evansville	All	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	1.3	0.0	2.6
	Female														
	Male	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	1.3	0.0	2.6
	Unknown														
Galena	All	0.0	0.0	0.0	0.0	1.9	102.1	0.0	0.0	0.0	0.0	27.0	0.0	0.0	131.0
	Female	0.0	0.0	0.0	0.0	0.0	19.3	0.0	0.0	0.0	0.0	17.3	0.0	0.0	36.6
	Male	0.0	0.0	0.0	0.0	1.9	82.8	0.0	0.0	0.0	0.0	7.7	0.0	0.0	92.5
	Unknown	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0	1.9
Huslia	All	8.1	0.0	0.0	0.0	0.0	47.1	0.0	0.0	2.7	0.0	1.3	21.5	0.0	80.7
	Female	8.1	0.0	0.0	0.0	0.0	1.3	0.0	0.0	1.3	0.0	1.3	21.5	0.0	33.6
	Male	0.0	0.0	0.0	0.0	0.0	45.7	0.0	0.0	1.3	0.0	0.0	0.0	0.0	47.1
	Unknown														
Kaltag	All	1.4	0.0	0.0	0.0	2.8	20.7	2.8	0.0	0.0	0.0	9.6	1.4	1.4	40.0
	Female	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	0.0	0.0	6.9
	Male	0.0	0.0	0.0	0.0	2.8	19.3	2.8	0.0	0.0	0.0	4.1	1.4	0.0	30.3
	Unknown	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	1.4	2.8
Nulato	All	0.0	0.0	0.0	0.0	0.0	56.3	0.0	0.0	0.0	0.0	10.9	0.0	0.0	67.2
	Female	0.0	0.0	0.0	0.0	0.0	6.3	0.0	0.0	0.0	0.0	4.7	0.0	0.0	10.9
	Male	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	6.3	0.0	0.0	56.3
	Unknown														
Ruby	All	0.0	0.0	0.0	0.0	0.0	19.6	0.0	0.0	0.0	0.0	8.7	0.0	0.0	28.4
	Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	0.0	0.0	3.3
	Male	0.0	0.0	0.0	0.0	0.0	19.6	0.0	0.0	0.0	0.0	4.4	0.0	0.0	24.0
	Unknown	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	1.1
Tanana	All	0.0	0.0	0.0	0.0	0.0	38.8	0.0	1.7	0.0	0.0	0.0	1.7	0.0	42.2
	Female	0.0	0.0	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4
	Male	0.0	0.0	0.0	0.0	0.0	35.4	0.0	1.7	0.0	0.0	0.0	1.7	0.0	38.8
	Unknown														

Figure 2. Moose Harvests by Sex and Month, Ten Middle Yukon Communities, April 1997 - March 1998



consisted of small, mixed-sex harvests occurring in April (13 moose), August (10 moose), December (4 moose), October (3 moose), and November (3 moose). In all communities, the fall harvest period accounted for the majority of the community moose harvest and the harvest of bulls exceeded the harvest of cows by a substantial margin. Seasons and other harvest regulations for moose in the middle Yukon-Koyukuk area are summarized in Appendix C.

Location of Moose Harvests

Table 4 provides information on the harvest of moose by game management unit (GMU) and uniform coding unit (UCU). Overall, hunters from survey communities reported harvesting moose during the 12-month survey period in GMUs 20C, 20F, 21A, 21B, 21D, and 24. Unit 21D was utilized by hunters from six of the ten survey communities and unit 24 was utilized by five survey communities while the remaining four units were utilized by moose hunters from just one of the survey communities. Within these six units, moose hunters from the survey communities utilized a total of 49 UCUs. Only three UCUs were utilized by hunters from more than two survey communities, and only seven UCUs produced harvests of 20 moose or more. The largest number of moose taken in a single UCU was 75 moose taken in 24Z 0101 in the vicinity of Huslia. A map showing area UCUs is included as Appendix B.

Moose harvests for individual communities tended to be concentrated in the UCUs immediately surrounding, or in close proximity to, that community. For example, 88 percent of the moose harvested by Huslia moose hunters came from one UCU (24Z 0101) immediately surrounding the community. And while Galena moose hunters reported harvests in 13 UCUs, more than any other community, four UCUs immediately surrounding Galena (within a 20 mile radius) accounted for 63 percent of that community's moose harvest. The report of seven moose taken by Tanana hunters in three UCUs on the lower Koyukuk River, and two moose taken by Galena hunters on the middle Koyukuk River between Huslia and Hughes, demonstrate that small

Table 4. The estimated harvest of moose by uniform coding unit, April 1997 - March 1998.

	Study Community											
Uniform Coding Unit	Alatna	Allakaket	Bettles	Evansville	Galena	Huslia	Kaltag	Nulato	Ruby	Tanana	Total	Percent
Grand Total	9.0	43.4	0.0	2.6	131.0	80.7	40.0	67.2	28.4	42.2	444.4	100.0%
Percent	2.0%	9.8%	0.0%	0.6%	29.5%	18.2%	9.0%	15.1%	6.4%	9.5%	100.0%	
Total GMU 20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.6	23.6	5.3%
Subtotal GMU 20C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	1.7	0.4%
20C 0101	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	1.7	0.4%
Subtotal GMU 20F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.9	21.9	4.9%
20F 0101	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	3.4	0.8%
20F 0201	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.8	6.8	1.5%
20F 0601	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.8	11.8	2.7%
Total GMU 21	0.0	0.0	0.0	0.0	125.2	4.0	40.0	67.2	28.4	18.6	283.4	63.8%
Subtotal GMU 21A	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	0.0	0.0	8.3	1.9%
21A 0301	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	0.0	0.0	8.3	1.9%
Subtotal GMU 21B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.3	11.8	27.1	6.1%
21B 0101	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.5	0.0	6.5	1.5%
21B 0102	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.4	8.4	1.9%
21B 0201	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.0	2.2	0.5%
21B 0301	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	3.4	8.8	2.0%
21B 0501	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	1.1	0.2%
Subtotal GMU 21D	0.0	0.0	0.0	0.0	125.2	4.0	31.7	67.2	13.1	6.8	248.0	55.8%
21D 0101	0.0	0.0	0.0	0.0	0.0	0.0	11.0	0.0	0.0	0.0	11.0	2.5%
21D 0102	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.0	0.0	2.8	0.6%
21D 0103	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	0.0	0.0	8.3	1.9%
21D 0104	0.0	0.0	0.0	0.0	0.0	0.0	8.3	14.1	0.0	0.0	22.3	5.0%
21D 0105	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.4	0.0	0.0	9.4	2.1%
21D 0201	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	1.9	0.4%
21D 0301	0.0	0.0	0.0	0.0	15.4	0.0	0.0	14.1	0.0	0.0	29.5	6.6%
21D 0302	0.0	0.0	0.0	0.0	32.7	0.0	0.0	1.6	0.0	3.4	37.7	8.5%
21D 0303	0.0	0.0	0.0	0.0	21.2	0.0	0.0	0.0	0.0	0.0	21.2	4.8%
21D 0304	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4	0.0	4.4	1.0%
21D 0305	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4	0.0	4.4	1.0%
21D 0401	0.0	0.0	0.0	0.0	7.7	0.0	0.0	0.0	1.1	0.0	8.8	2.0%
21D 0501	0.0	0.0	0.0	0.0	13.5	0.0	0.0	0.0	0.0	0.0	13.5	3.0%
21D 0601	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	1.1	0.0	3.0	0.7%
21D 0701	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.0	2.2	0.5%
21D 0801	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.7	0.0	0.0	4.7	1.1%
21D 0802	0.0	0.0	0.0	0.0	7.7	0.0	0.0	14.1	0.0	0.0	21.8	4.9%
21D 0803	0.0	0.0	0.0	0.0	1.9	0.0	1.4	6.3	0.0	0.0	9.6	2.2%
21D 0804	0.0	0.0	0.0	0.0	19.3	0.0	0.0	3.1	0.0	1.7	24.1	5.4%
21D 0901	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	1.7	0.4%
21D 1101	0.0	0.0	0.0	0.0	1.9	1.3	0.0	0.0	0.0	0.0	3.3	0.7%
21D 1201	0.0	0.0	0.0	0.0	0.0	2.7	0.0	0.0	0.0	0.0	2.7	0.6%
24Z 0101	0.0	0.0	0.0	0.0	3.9	71.3	0.0	0.0	0.0	0.0	75.1	16.9%
24Z 0102	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	1.9	0.4%
24Z 0104	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.2%
24Z 0105	1.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.7%
24Z 0301	0.0	0.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	4.0	0.9%
24Z 0401	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	1.3	0.3%
24Z 0701	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.2%
24Z 0702	1.0	8.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.5	2.1%
24Z 0703	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.5%
24Z 0705	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.2%
24Z 0801	1.0	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.4	1.9%
24Z 0901	5.0	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	1.8%
24Z 0903	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.2%
24Z 1001	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.5%
24Z 1101	1.0	8.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.5	2.1%
Total GMU 24	9.0	43.4	0.0	2.6	5.8	76.7	0.0	0.0	0.0	0.0	137.4	30.9%
Subtotal GMU 24Z	9.0	43.4	0.0	2.6	5.8	76.7	0.0	0.0	0.0	0.0	137.4	30.9%
24Z 0802	0.0	5.3	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	7.9	1.8%

numbers of hunters from these communities occasionally travel long distances to harvest moose.

The seven UCUs with 20 or more moose harvested included 24Z 0101 (75 moose), 21D 0302 (38 moose), 21D 0301 (30 moose), 21D 0803 (24 moose), 21D 0104 (22 moose), 21D 0802 (22 moose), and 21D 0303 (21 moose). These UCUs form a contiguous block encompassing the lower Koyukuk River, the Yukon River in the vicinity of Galena, and the Kaiyuh Flats. Collectively, these seven UCUs accounted for 232 moose or more than one-half (52 percent) of the estimated 444 moose harvested.

Caribou

Local Caribou Harvest and Use

Caribou are not as evenly distributed across the middle Yukon and Koyukuk River region as moose and were not readily accessible to hunters in all survey communities. Nevertheless, some households in all ten communities used caribou meat (Table 5). Overall, about 20 percent of all households in the ten communities used caribou meat during the survey period. The percentage of households using caribou ranged from 1.5 percent in Ruby to 72.7 percent in Alatna. Overall, 8.6 percent of the households hunted for caribou and 5.3 percent harvested caribou during the period April 1997 through March 1998.

The percentage of households receiving caribou meat from other households averaged 15.5 percent overall and ranged from 1.5 percent in Ruby to 50.0 percent in Evansville. Despite no harvest of caribou in the communities of Bettles, Ruby, and Tanana, caribou meat was used by 14.3 percent, 1.5 percent, and 7.8 percent of the households in those communities respectively. This would seem to indicate that caribou meat was being provided to residents of these communities from hunters in other communities. The percentage of households giving caribou

Table 5. Levels of participation in the use and harvest of caribou, April 1997 - March 1998.

	Participation of Households					Estimated Harvest Levels						Estimated Hunter Information				
									95% Confidence Limit of Total Harvest			Total			Successful	
Community	Use (%)	Att (%)	Hrv (%)	Rec (%)	Gav (%)	Total	Per Household	Per Person	%	Low	High	Number	% of Population	Harvest/ Hunter	Number	Harvest/ Hunter
All	19.6	8.6	5.3	15.5	6.8	140.6	0.21	0.07	24.6	106.0	175.1	74.1	3.5	1.90	42.4	3.31
Alatna	72.7	45.5	36.4	45.5	36.4	21.0	1.91	0.84		21.0	21.0	7.0	28.0	3.00	6.0	3.50
Allakaket	42.3	15.4	5.8	38.5	9.6	10.6	0.19	0.06	34.2	10.0	14.2	12.7	7.2	0.83	3.2	3.33
Bettles	14.3	28.6	0.0	14.3	14.3	0.0	0.00	0.00	0.0	0.0	0.0	5.1	22.2	0.00	0.0	0.00
Evansville	50.0	14.3	7.1	50.0	21.4	2.6	0.14	0.06	101.8	2.0	5.2	3.9	8.8	0.67	2.6	1.00
Galena	15.8	7.4	6.3	11.6	8.4	38.5	0.21	0.07	63.4	20.0	62.9	13.5	2.5	2.86	11.6	3.33
Huslia	46.6	20.7	15.5	31.0	13.8	56.5	0.72	0.26	41.6	42.0	80.0	18.8	8.6	3.00	14.8	3.82
Kaltag	20.0	4.4	4.4	17.8	6.7	8.3	0.13	0.03	89.3	6.0	15.6	2.8	1.1	3.00	2.8	3.00
Nulato	5.5	3.6	1.8	3.6	1.8	3.1	0.04	0.01	120.4	2.0	6.9	3.1	1.0	1.00	1.6	2.00
Ruby	1.5	1.5	0.0	1.5	0.0	0.0	0.00	0.00	0.0	0.0	0.0	2.2	1.0	0.00	0.0	0.00
Tanana	7.8	3.1	0.0	7.8	0.0	0.0	0.00	0.00	0.0	0.0	0.0	5.1	1.7	0.00	0.0	0.00

meat to others averaged 6.8 percent overall and ranged from zero percent in Ruby and Tanana to 36.4 percent in Alatna.

An estimated 141 caribou (with a confidence range of 106 to 175 caribou) were harvested by hunters from the 10 survey communities. Overall, harvest levels averaged 0.21 caribou per household and ranged from no caribou harvested in Bettles, Ruby, and Tanana, to 1.91 caribou per household in Alatna. Using a conversion factor of 130 pounds of meat per caribou, the estimated harvest total of 141 caribou provided 18,333 pounds of caribou meat for area residents or almost 9 pounds per person. While caribou meat appears to have been broadly distributed within and between communities, three communities (Alatna, Galena, and Huslia) accounted for 82 percent of the overall caribou harvest for the 10 survey communities. The per capita harvest of caribou in Alatna (109 pounds) was more than three times greater than the next highest community, Huslia (34 pounds).

Sex and Timing of Caribou Harvests

Table 6 and Figure 3 show that caribou harvests occurred in all calendar months except May, June, and July, with February being the month when the most caribou were taken. Of the 141 caribou taken, 48 (34 percent) were taken in February, followed by 23 (16 percent) taken in November, 21 (15 percent) taken in January, and 17 (12 percent) taken in April. The remainder of the caribou harvest consisted of small harvests taken in September (10 caribou), March (8 caribou), October (5 caribou), and August (3 caribou). Of the estimated 141 caribou harvested during the survey period, 93 (66 percent) were bulls and 48 (34 percent) were cows.

Location of Caribou Harvests

Table 7 details the GMU and UCU location of caribou harvests by survey communities during the 12-month survey period. Compared to the broad area utilized for moose hunting, caribou

Table 6. Estimated harvest of caribou by sex and month, April 1997 - March 1998.

Community	Sex	April	May	June	July	August	September	October	November	December	January	February	March	Unknown	Total
All	All	17.2	0.0	0.0	0.0	2.6	10.4	5.0	22.6	6.5	20.6	48.1	7.5	0.0	140.6
	Female	4.1	0.0	0.0	0.0	0.0	4.2	0.0	4.0	4.6	6.9	22.7	1.1	0.0	47.7
	Male	13.1	0.0	0.0	0.0	2.6	6.2	5.0	18.5	1.9	13.7	25.4	6.4	0.0	92.8
	Unknown														
Alatna	All	9.0	0.0	0.0	0.0	0.0	3.0	5.0	0.0	0.0	0.0	0.0	4.0	0.0	21.0
	Female														
	Male	9.0	0.0	0.0	0.0	0.0	3.0	5.0	0.0	0.0	0.0	0.0	4.0	0.0	21.0
	Unknown														
Allakaket	All	0.0	0.0	0.0	0.0	0.0	7.4	0.0	1.1	0.0	0.0	0.0	2.1	0.0	10.6
	Female	0.0	0.0	0.0	0.0	0.0	4.2	0.0	0.0	0.0	0.0	0.0	1.1	0.0	5.3
	Male	0.0	0.0	0.0	0.0	0.0	3.2	0.0	1.1	0.0	0.0	0.0	1.1	0.0	5.3
	Unknown														
Bettles	All														
	Female														
	Male														
	Unknown														
Evansville	All	0.0	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6
	Female														
	Male	0.0	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6
	Unknown														
Galena	All	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	0.0	34.7	0.0	0.0	38.5
	Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0	17.3	0.0	0.0	19.3
	Male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0	17.3	0.0	0.0	19.3
	Unknown														
Huslia	All	1.3	0.0	0.0	0.0	0.0	0.0	0.0	21.5	2.7	17.5	13.4	0.0	0.0	56.5
	Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	2.7	5.4	5.4	0.0	0.0	17.5
	Male	1.3	0.0	0.0	0.0	0.0	0.0	0.0	17.5	0.0	12.1	8.1	0.0	0.0	39.0
	Unknown														
Kaltag	All	6.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	8.3
	Female	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.1
	Male	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	4.1
	Unknown														
Nulato	All	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.0	0.0	0.0	3.1
	Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0	1.6
	Male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0	1.6
	Unknown														
Ruby	All														
	Female														
	Male														
	Unknown														
Tanana	All														
	Female														
	Male														
	Unknown														

Figure 3. Caribou Harvests by Sex and Month, Ten Middle Yukon Communities, April 1997 - March 1998

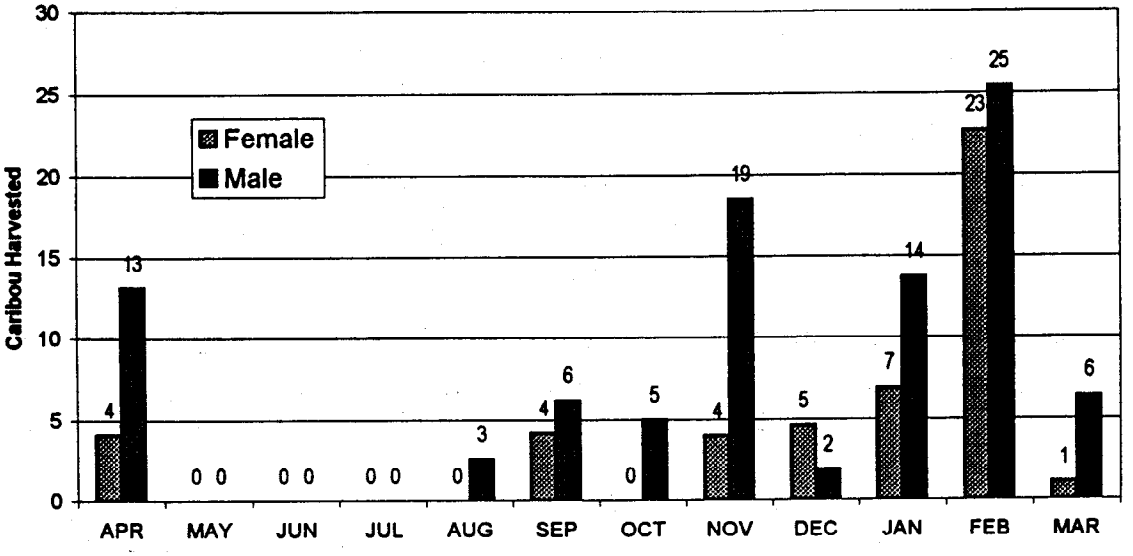


Table 7. The estimated harvest of caribou by uniform coding unit, April 1997 - March 1998.

	Study Community											
Uniform Coding Unit	Alatna	Allakaket	Bettles	Evansville	Galena	Huslia	Kaltag	Nulato	Ruby	Tanana	Total	Percent
Grand Total	21.0	10.6	0.0	2.6	38.5	56.5	8.3	3.1	0.0	0.0	140.6	100.0%
Percent	14.9%	7.5%	0.0%	1.8%	27.4%	40.2%	5.9%	2.2%	0.0%	0.0%	100.0%	
Total GMU 21	0.0	0.0	0.0	0.0	3.9	0.0	8.3	0.0	0.0	0.0	12.1	8.6%
Subtotal GMU 21D	0.0	0.0	0.0	0.0	3.9	0.0	8.3	0.0	0.0	0.0	12.1	8.6%
21D 0103	0.0	0.0	0.0	0.0	1.9	0.0	8.3	0.0	0.0	0.0	10.2	7.3%
21D 0802	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	1.9	1.4%
Total GMU 22	0.0	0.0	0.0	0.0	7.7	0.0	0.0	3.1	0.0	0.0	10.8	7.7%
Subtotal GMU 22A	0.0	0.0	0.0	0.0	7.7	0.0	0.0	3.1	0.0	0.0	10.8	7.7%
22A 0301	0.0	0.0	0.0	0.0	7.7	0.0	0.0	3.1	0.0	0.0	10.8	7.7%
Total GMU 23	0.0	0.0	0.0	0.0	19.3	0.0	0.0	0.0	0.0	0.0	19.3	13.7%
Subtotal GMU 23Z	0.0	0.0	0.0	0.0	19.3	0.0	0.0	0.0	0.0	0.0	19.3	13.7%
23Z 2001	0.0	0.0	0.0	0.0	5.8	0.0	0.0	0.0	0.0	0.0	5.8	4.1%
23Z Unspecified	0.0	0.0	0.0	0.0	13.5	0.0	0.0	0.0	0.0	0.0	13.5	9.6%
Total GMU 24	21.0	10.6	0.0	2.6	7.7	56.5	0.0	0.0	0.0	0.0	98.3	70.0%
Subtotal GMU 24Z	21.0	10.6	0.0	2.6	7.7	56.5	0.0	0.0	0.0	0.0	98.3	70.0%
24Z 0101	0.0	0.0	0.0	0.0	0.0	39.0	0.0	0.0	0.0	0.0	39.0	27.7%
24Z 0102	0.0	0.0	0.0	0.0	0.0	6.7	0.0	0.0	0.0	0.0	6.7	4.8%
24Z 0103	0.0	0.0	0.0	0.0	7.7	4.0	0.0	0.0	0.0	0.0	11.7	8.4%
24Z 0301	0.0	0.0	0.0	0.0	0.0	6.7	0.0	0.0	0.0	0.0	6.7	4.8%
24Z 0801	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	1.5%
24Z 0901	21.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.0	14.9%
24Z 0903	0.0	8.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.5	6.0%
24Z 1201	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	2.6	1.8%

harvest areas were relatively thinly scattered across the region, reflecting the spotty distribution of caribou in this area. Caribou harvests were reported in just 12 UCUs located in GMUs 21D, 22A, 23, and 24. Each community harvesting caribou did so in very localized areas. Four survey communities utilized single UCUs for harvesting caribou: Alatna (24Z 0902), Evansville (24Z 1201), Kaltag (21D 0103), and Nulato (22A 0301). Allakaket hunters utilized two UCUs for caribou hunting, but fully 80 percent of the caribou harvest by hunters from that community took place in UCU 24Z 0903. Huslia utilized four UCUs, all within GMU 24, with 69 percent of the harvest occurring in UCU 24Z 0101. Galena hunters took caribou in at least five UCUs located in four GMUs, with 50 percent of that harvest taking place in GMU 23.

Black Bear

Local Black Bear Harvest and Use

Hunters in all survey communities except Bettles harvested black bear. Table 8 shows levels of participation and use of black bear. Overall, slightly more households reported using, hunting, harvesting, and sharing black bear than caribou during the 12-month survey period. An average of 21.3 percent of all households used black bear, ranging from no households in Bettles to 73.1 percent of households in Allakaket. About 12 percent of all households hunted black bear and 7 percent of all households harvested one or more black bear during the survey period. About 16 percent of all households received black bear and 7 percent gave black bear to other households.

An estimated 68 black bear (with a confidence range of 53 to 82 black bear) were harvested by hunters from the 10 survey communities. The Koyukuk River communities of Alatna, Allakaket, and Huslia showed the highest rates of black bear harvest and use. The 41 black bears harvested by these three communities accounted for 60 percent of the total harvest by all survey communities. Household harvest levels for black bear ranged from none in Bettles to about

Table 8. Levels of participation in the use and harvest of black bear, April 1997 - March 1998.

	Participation of Households					Estimated Harvest Levels						Estimated Hunter Information				
									95% Confidence Limit of Total Harvest			Total			Successful	
Community	Use (%)	Att (%)	Hrv (%)	Rec (%)	Gav (%)	Total	Per Household	Per Person	%	Low	High	Number	% of Population	Harvest/ Hunter	Number	Harvest/ Hunter
All	21.3	12.3	7.0	15.6	7.0	67.5	0.10	0.03	21.2	53.2	81.8	138.4	6.6	0.49	53.0	1.27
Alatna	72.7	36.4	36.4	36.4	27.3	4.0	0.36	0.16		4.0	4.0	6.0	24.0	0.67	4.0	1.00
Allakaket	73.1	34.6	13.5	65.4	15.4	9.5	0.17	0.05	17.8	9.0	11.2	37.0	21.1	0.26	7.4	1.29
Bettles																
Evansville	7.1	14.3	7.1	0.0	0.0	1.3	0.07	0.03	101.8	1.0	2.6	5.1	11.8	0.25	1.3	1.00
Galena	12.6	10.5	7.4	7.4	7.4	17.3	0.09	0.03	57.8	9.0	27.4	32.7	6.1	0.53	17.3	1.00
Huslia	48.3	25.9	19.0	29.3	19.0	26.9	0.34	0.12	33.6	20.0	35.9	29.6	13.6	0.91	16.1	1.67
Kaltag	8.9	4.4	2.2	6.7	2.2	1.4	0.02	0.01	105.5	1.0	2.8	4.1	1.7	0.33	1.4	1.00
Nulato	12.7	5.5	1.8	12.7	1.8	1.6	0.02	0.01	120.4	1.0	3.4	10.9	3.5	0.14	1.6	1.00
Ruby	12.1	6.1	3.0	9.1	4.5	2.2	0.03	0.01	40.5	2.0	3.1	4.4	2.0	0.50	2.2	1.00
Tanana	9.4	6.3	1.6	7.8	1.6	3.4	0.03	0.01	127.5	2.0	7.7	8.4	2.9	0.40	1.7	2.00

one-third of a bear per household in Alatna (.36 bear) and Huslia (.34 bear). Using a conversion factor of 100 pounds of meat per bear, the 68 black bear harvested during the survey year provided an estimated 6,800 pounds of meat for area residents or about 3 pounds of black bear meat per person.

Sex and Timing of Black Bear Harvests

During the period April 1997 through March 1998, black bears were harvested in every calendar month except July, January, and February (Table 9 and Figure 4). Seventy-eight percent of the black bear harvest took place during the four-month period August through November. September was the peak harvesting month (22 bears) followed by November (14 bears) with those two months accounting for more than one-half of the overall harvest. Month of harvest was not known for 3 of the estimated 68 bears harvested.

There is significant annual and individual variability in denning dates for bears. However, in interior Alaska, most black bears enter their winter dens by mid-October and emerge from dens by mid April (J. Hechtel, ADF&G, Pers. Comm). This being the case, it is likely that some of the bears harvested in October, and most of the bears taken in November, December, and March, represent bears taken in dens, a practice still common among Koyukon Athabaskan hunters. Of the black bears harvested for which sex information was given, 82 percent were males and 18 percent were females. Sex information was not provided for two of the bears.

Location of Black Bear Harvests

Black bear harvests harvests took place in four GMUs—20F, 21B, 21D, and 24 (Table 10). Sixty percent of the black bear harvest (41 bears) occurred in GMU 24. Twenty-two black bears, or 33 percent of the black bear harvest was taken in GMU 21D, with the small remainder of the harvest taken in GMUs 20F and 21B. Black bear are frequently taken in conjunction with

Table 9. Estimated harvest of black bear by sex and month, April 1997 - March 1998.

Community	Sex	April	May	June	July	August	September	October	November	December	January	February	March	Unknown	Total
All	All	1.0	1.7	1.7	0.0	8.7	21.7	8.4	14.4	1.9	0.0	0.0	5.3	2.7	67.5
	Female	0.0	1.7	0.0	0.0	1.3	3.7	0.0	5.2	0.0	0.0	0.0	0.0	0.0	11.9
	Male	1.0	0.0	1.7	0.0	5.5	18.0	8.4	9.2	1.9	0.0	0.0	5.3	2.7	53.7
	Unknown	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9
Alatna	All	1.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	4.0
	Female	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
	Male	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	3.0
	Unknown														
Allakaket	All	0.0	0.0	0.0	0.0	3.2	5.3	0.0	0.0	0.0	0.0	0.0	1.1	0.0	9.5
	Female														
	Male	0.0	0.0	0.0	0.0	3.2	5.3	0.0	0.0	0.0	0.0	0.0	1.1	0.0	9.5
	Unknown														
Bettles	All														
	Female														
	Male														
	Unknown														
Evansville	All	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3
	Female	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3
	Male														
	Unknown														
Galena	All	0.0	0.0	0.0	0.0	1.9	1.9	1.9	7.7	1.9	0.0	0.0	1.9	0.0	17.3
	Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	0.0	0.0	0.0	0.0	0.0	3.9
	Male	0.0	0.0	0.0	0.0	0.0	1.9	1.9	3.9	1.9	0.0	0.0	1.9	0.0	11.6
	Unknown	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9
Huslia	All	0.0	0.0	0.0	0.0	1.3	9.4	5.4	6.7	0.0	0.0	0.0	1.3	2.7	26.9
	Female	0.0	0.0	0.0	0.0	0.0	2.7	0.0	1.3	0.0	0.0	0.0	0.0	0.0	4.0
	Male	0.0	0.0	0.0	0.0	1.3	6.7	5.4	5.4	0.0	0.0	0.0	1.3	2.7	22.9
	Unknown														
Kaltag	All	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4
	Female														
	Male	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4
	Unknown														
Nulato	All	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6
	Female														
	Male	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6
	Unknown														
Ruby	All	0.0	0.0	0.0	0.0	0.0	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	2.2
	Female														
	Male	0.0	0.0	0.0	0.0	0.0	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	2.2
	Unknown														
Tanana	All	0.0	1.7	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4
	Female	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7
	Male	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7
	Unknown														

Figure 4. Black Bear Harvests by Sex and Month, Ten Middle Yukon Communities, April 1997 - March 1998

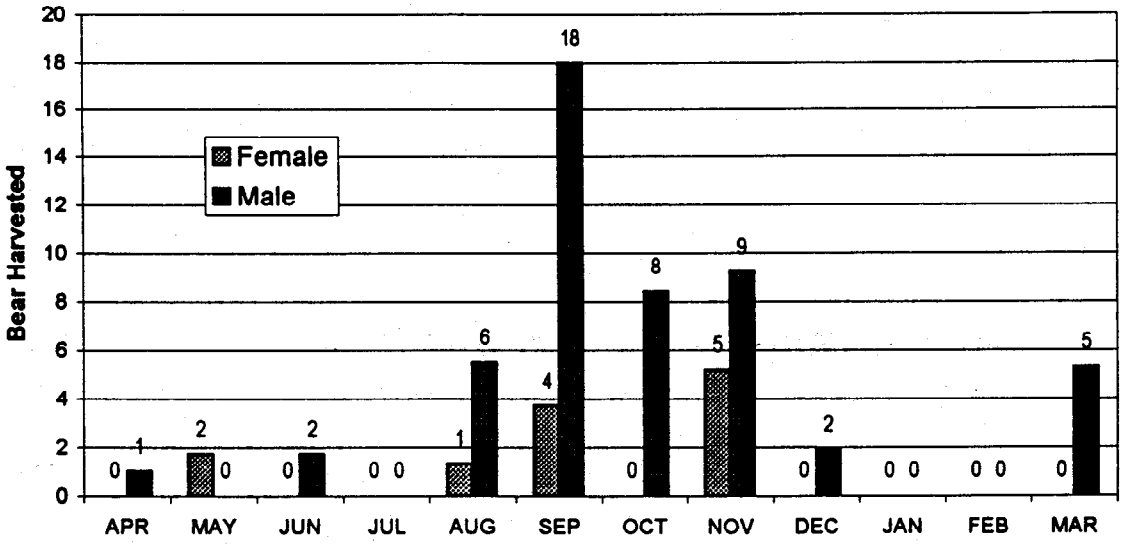


Table 10. The estimated harvest of black bear by uniform coding unit, April 1997 - March 1998.

	Study Community											
Uniform Coding Unit	Alatna	Allakaket	Bettles	Evansville	Galena	Huslia	Kaltag	Nulato	Ruby	Tanana	Total	Percent
Grand Total	4.0	9.5	0.0	1.3	17.3	26.9	1.4	1.6	2.2	3.4	67.5	100.0%
Percent	5.9%	14.1%	0.0%	1.9%	25.7%	39.8%	2.0%	2.3%	3.2%	5.0%	100.0%	
Total GMU 20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	3.4	5.0%
Subtotal GMU 20F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	3.4	5.0%
20F 0201	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	3.4	5.0%
Total GMU 21	0.0	0.0	0.0	0.0	15.4	2.7	1.4	1.6	2.2	0.0	23.2	34.4%
Subtotal GMU 21B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	1.1	1.6%
21B 0101	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	1.1	1.6%
Subtotal GMU 21D	0.0	0.0	0.0	0.0	15.4	2.7	1.4	1.6	1.1	0.0	22.1	32.8%
21D 0101	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	1.6	2.3%
21D 0102	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	1.4	2.0%
21D 0302	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	1.9	2.9%
21D 0303	0.0	0.0	0.0	0.0	7.7	0.0	0.0	0.0	0.0	0.0	7.7	11.4%
21D 0304	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	1.1	1.6%
21D 0501	0.0	0.0	0.0	0.0	5.8	0.0	0.0	0.0	0.0	0.0	5.8	8.6%
21D 1101	0.0	0.0	0.0	0.0	0.0	2.7	0.0	0.0	0.0	0.0	2.7	4.0%
Total GMU 24	4.0	9.5	0.0	1.3	1.9	24.2	0.0	0.0	0.0	0.0	40.9	60.6%
Subtotal GMU 24Z	4.0	9.5	0.0	1.3	1.9	24.2	0.0	0.0	0.0	0.0	40.9	60.6%
24Z 0101	0.0	0.0	0.0	0.0	1.9	20.2	0.0	0.0	0.0	0.0	22.1	32.7%
24Z 0105	1.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	3.0%
24Z 0301	0.0	0.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	4.0	6.0%
24Z 0701	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.6%
24Z 0702	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.6%
24Z 0801	0.0	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	4.7%
24Z 0802	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.6%
24Z 0901	3.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	7.6%
24Z 1201	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.9%

fall moose hunting, so black bear harvests were reported in many of the same UCUs as moose harvests. While black bear harvests occurred in a total of 18 UCUs, one UCU (24Z 0101) accounted for 22 of the 68 bears harvested or 33 percent of the total harvest. Only three other UCUs had harvests of five or more black bear.

Brown Bear

Local Brown Bear Hunting and Harvest

There were low levels of involvement in brown bear hunting by residents of the ten survey communities (see Table 11). Overall, a total of just nine hunters, representing less than one percent of area households, hunted for brown bear. Small numbers of hunters in Alatna, Evansville, Ruby and Tanana pursued brown bear. During the survey period, April 1997 through March 1998, no brown bear were harvested and no use or sharing of brown bear meat was reported by surveyed households.

COMPARISON OF 1997 AND 1998 COMMUNITY HARVESTS

The 1998 harvest survey represented the second year of data collection in five of the survey communities. The 1997 pilot project collected harvest information in Galena, Kaltag, Nulato, Ruby and Tanana for the same species using the same methodology as the 1998 survey. Comparison of these data sets provides some information on the year-to-year variability of local big game harvests. Table 12 presents data from both survey years for these five communities.

Only small variations are noted in community and sample size between study years. The 1997 survey estimated the population of the five communities to be 1,615 people residing in 510 households, while the 1998 survey resulted in estimates of 1,609 people in 511 households. In

Table 11. Levels of participation in the use and harvest of brown bear, April 1997 - March 1998.

	Participation of Households					Estimated Harvest Levels						Estimated Hunter Information				
									95% Confidence Limit of Total Harvest			Total			Successful	
Community	Use (%)	Att (%)	Hrv (%)	Rec (%)	Gav (%)	Total	Per Household	Per Person	%	Low	High	Number	% of Population	Harvest/ Hunter	Number	Harvest/ Hunter
All	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.6	0.4	0.0	0.0	0.0
Alatna	0.0	9.1	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	2.0	8.0	0.0	0.0	0.0
Allakaket																
Bettles																
Evansville	0.0	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	8.8	0.0	0.0	0.0
Galena																
Huslia																
Kaltag																
Nulato																
Ruby	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.5	0.0	0.0	0.0
Tanana	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.6	0.0	0.0	0.0

Table 12. Comparison of 1997 and 1998 Household Survey Results.

	Galena		Kaltag		Nulato		Ruby		Tanana		TOTAL	
	1997	1998	1997	1998	1997	1998	1997	1998	1997	1998	1997	1998
HOUSEHOLDS AND POPULATION												
Total Number of Households	182	183	61	62	90	86	70	72	107	108	510	511
Number of Households Surveyed	77	95	53	45	57	55	61	66	66	64	314	325
Percent of households Surveyed	42%	52%	87%	73%	63%	64%	87%	92%	62%	59%	62%	64%
Estimated Community Population	548	536	227	247	328	311	215	220	297	295	1,615	1,609
MOOSE												
Households Using Moose	83%	87%	85%	96%	84%	95%	85%	99%	94%	89%	86%	92%
Households Hunting Moose	77%	68%	60%	49%	54%	75%	62%	83%	67%	66%	67%	69%
Households Harvesting Moose	58%	56%	38%	49%	42%	62%	34%	38%	29%	33%	44%	49%
Estimated Moose Harvest	130	131	31	40	47	67	25	28	34	42	268	308
CARIBOU												
Households Using Caribou	12%	16%	30%	20%	7%	6%	10%	2%	12%	8%	13%	11%
Households Hunting Caribou	10%	7%	17%	4%	5%	4%	2%	2%	8%	3%	9%	5%
Households Harvesting Caribou	10%	6%	11%	4%	5%	2%	0%	0%	3%	0%	7%	3%
Estimated Caribou Harvest	40	39	16	8	13	3	0	0	3	0	72	50
BLACK BEAR												
Households Using Black Bear	14%	13%	17%	9%	7%	13%	12%	12%	30%	9%	16%	11%
Households Hunting Black Bear	12%	11%	9%	4%	5%	6%	8%	6%	27%	6%	13%	7%
Households Harvesting Black Bear	9%	7%	6%	2%	5%	2%	8%	3%	18%	2%	10%	4%
Estimated Black Bear Harvest	19	17	3	1	5	2	9	2	24	3	61	24
BROWN BEAR												
Households Using Brown Bear	3%	0%	2%	0%	0%	0%	2%	0%	2%	0%	2%	0%
Households Hunting Brown Bear	3%	0%	0%	0%	0%	0%	0%	2%	2%	2%	1%	1%
Households Harvesting Brown Bear	1%	0%	0%	0%	0%	0%	0%	0%	2%	0%	1%	0%
Estimated Brown Bear Harvest	2	0	0	0	0	0	0	0	2	0	4	0

the 1997 survey, 314 households (62 percent) were surveyed while in the 1998 survey, 325 households (64 percent) were surveyed in the five survey communities.

Moose harvest estimates for 1998 were higher for each survey community than in 1997. For Galena, however, this increase amounted to only one moose (130 in 1997 and 131 in 1998). The overall harvest estimate of 268 moose in 1997 compares with an estimated 308 moose harvested by the five communities in 1998, an increase of 40 animals. In each of the five survey communities, the estimated caribou and black bear harvests for 1998 were lower than those for 1997. The estimated overall caribou harvest declined from 72 in 1997 to 50 in 1998 and the estimated black bear harvest declined from 61 in 1997 to 24 in 1998.

For the five communities combined, the percent of households using, hunting, and harvesting big game animals in 1997 and 1998 was generally similar, or within about 5 percentage points. With the increased harvest of moose, the percent of households using moose meat increased from 86 percent on the 1997 survey to 92 percent in 1998. Likewise, with the decrease in the overall harvest of black bears, the percent of households hunting and harvesting black bear declined six percent from 1997 to 1998.

At the community level, the greatest difference comparing 1997 and 1998 harvest estimates is seen in Tanana, where the harvest of black bear declined from 24 bears in 1997 to just 3 bears in 1998. Likewise, the percentage of Tanana households using, hunting, and harvesting black bear declined 21, 21, and 16 percent respectively, during the same period. Reasons for this difference in black bear hunting effort are not known. Other noteworthy differences within communities between survey years include: 1) larger numbers of Kaltag households using and harvesting moose in 1998 despite fewer households hunting moose; 2) lower levels of caribou use, hunting, and harvest in the middle Yukon River communities of Kaltag and Nulato in 1998,

and 3) an increase in the percent of Nulato households using black bear in 1998, despite a harvest of only two bears.

In general there appears to have been a relatively consistent hunting pattern for big game animals in the middle Yukon region between 1997 and 1998. This pattern establishes moose as the dominant big game resource relative to caribou and black bear, and indicates a generally low level of interest in harvesting brown bears.

COMPARISON OF HOUSEHOLD SURVEY AND PERMIT SYSTEM ESTIMATES OF MOOSE HARVEST

This section compares moose harvest estimates from the household survey with the moose harvest estimates derived from the state's harvest permit system. Within the study area, the state operates both registration permit and harvest ticket systems for moose. In the field, a hunter must have a harvest ticket or a registration permit depending on the area or season hunted. Hunters are instructed to return the attached harvest reports to ADF&G within a specified timeframe. Harvest tickets and registration permits are made available to hunters free of charge, but those who are 16 to 59 years of age must display a current state hunting license before receiving a permit or harvest ticket. During the fall hunting season, two hunter check-stations are operated by state and federal management agencies at key locations on the lower Koyukuk and Nowitna rivers. The check-stations serve to monitor hunting traffic in heavily hunted areas, gather biological information on harvested animals, and enforce hunting regulations including licensing and permit requirements.

Returned harvest reports from registration permits and harvest ticket systems are collectively referred to here as "permit returns" and constitute a data set with which to compare harvest information from the face-to-face hunter survey. Table 13 compares moose harvest estimates

Table 13. Comparison of 1997/98 moose harvest permit data with 1997/98 survey results.

		Harvest Permit Data				Survey Data			
Community	Total HHs	Permits Issued	Permits Returned	Number Hunting	Reported Harvest	Estimated Number of Hunters	Estimated Moose Harvest	95% CI Low	95% CI High
Alatna/Allakaket	66	24	15	13	8	86	52	49	56
Bettles/Evansville	27	11	7	6	2	14	3	2	5
Galena	183	277	195	174	86	210	131	112	150
Huslia	78	87	50	37	26	74	81	67	94
Kaltag	62	22	9	7	3	62	40	32	48
Nulato	86	130	78	69	41	103	67	56	78
Ruby	72	79	39	33	15	80	28	26	31
Tanana	108	64	41	37	9	110	42	32	53
Total	682	694	434	376	190	738	444	376	515

obtained through permit returns by residents of the 10 survey communities, with estimates from the household survey for the same period (April 1997 through March 1998). Data for Alatna and Allakaket have been combined as well as those for Bettles and Evansville because these communities share the same zipcodes, which were used to compile permit data by location. There were 694 permits issued to hunters residing in the 10 survey communities, and 434 harvest reports were returned (63 percent). Among those returning harvest reports, 376 (87 percent) reported hunting for moose. Of those, 190 (51 percent) were successful in harvesting a moose.

While it is difficult to make direct comparisons of the individual-based data provided by permit returns, and the household-based data provided by the survey, some general comparisons are possible. At first glance, participation in the moose permit system by local residents appears to be fairly high. The issuing of 694 permits and the survey estimate of 738 people hunting moose would seem to indicate that only a small percentage of hunters failed to obtain permits. However, examination of these data at the community level, shows that participation in the permit system is greater in some communities than in others. For example, 24 permits were issued in Alatna/Allakaket, where survey estimates indicate about 86 people in more than 50 households participated in moose hunting. Evidently, large numbers of individuals in that community hunted without obtaining required permits. Similarly, the number of permits issued in Kaltag and Tanana was substantially less than the estimated number of people hunting according to the survey. By contrast, in four communities (Galena, Huslia, Nulato, and Ruby) there appeared to be a high saturation of permits to hunters, where the number of permits issued nearly equals or exceeds the estimated number of moose hunters. The availability or unavailability of permits through local sources, and the requirement that hunters in some communities must pass through hunter check-stations to access certain hunting areas, are possible reasons for some communities participating in the permit system more than others.

As shown in Table 13, permit return rates ranged from 41 percent (Kaltag) to 70 percent (Galena). Among the 10 survey communities, permit return rates averaged about 63 percent overall, indicating that more than one-third of those issued permits failed to return them. Wildlife managers commonly assume that non-respondents probably did not harvest an animal and that permit returns approximate the harvest total. Comparing permit returns with results of the household survey calls this assumption into question. The combination of non-response by permitees and hunting by individuals who never obtained a permit, appears to result in the permit system missing substantial numbers of harvested moose. The 190 moose reported to ADF&G on permit returns from the 10 communities equals about 43 percent of the survey-extrapolation of 444 moose. Stated another way, harvest reporting under the permit system failed to account for about 57 percent of the moose harvest by local residents as determined by the survey.

Aside from the more practical problems of licenses and permits not being conveniently available to rural hunters through local sources as mentioned above, the permit system conflicts with local hunting practices which result in hunters sometimes taking moose outside of legal seasons and bag limit restrictions. Andersen and Alexander (1992) found that the single-moose bag limit associated with the permit system failed to accommodate the reality of subsistence hunting in rural Alaska where a relatively small number of hunters supply a community with meat through multiple harvests and shared proceeds. The inability of hunters to report actual harvests without incriminating themselves was found to be a major reason that some rural hunters choose not to participate fully in the permit system. Confidentiality assurances given under the household survey methodology appear to help obtain a more complete reporting of harvest information.

CONCLUSIONS

The 1998 harvest survey project succeeded in meeting all five project objectives in each survey community. Harvest estimates with confidence ranges were achieved for each of the four game species. Subsistence hunting, use, and sharing patterns for the survey year were documented. Information on the geographic location of big game harvests was collected. And there was local involvement in the data collection process, which helped develop interest and expertise among local residents for assisting with future survey work.

Survey results underscore the importance of moose as a subsistence resource in the middle Yukon and Koyukuk River region. Big game harvests, particularly moose, were widely shared within and between communities resulting in moose meat being used by a large majority of households in the region. Information on harvest locations indicate that moose hunting was an activity generally carried out in areas relatively close to home communities. Caribou and black bear also were hunted for food, but were utilized to a much lesser extent than moose. There was no measurable harvest or use of brown bear.

Harvest estimates for big game using retrospective household surveys appear to provide improvements over harvest permit systems for enumerating harvests by local hunters. The household survey methodology achieves improved harvest estimates by incorporating 1) high sampling fractions, 2) systematic sampling that allows for the expansion to unsurveyed hunters and the calculation of confidence intervals about the estimate, and 3) confidentiality assurances that improve reports of harvests that may fall outside legal realms. In contrast, it appears that harvest permit systems tend to under estimate local harvests of resources in rural areas because, 1) some hunters hunted without ever obtaining a permit, 2) hunters that do obtain

harvest permits sometimes fail to return the harvest report, and 3) returned harvest reports may not include harvests which may have occurred outside of legal seasons or bag limits.

Accurate harvest estimates are one of the most basic statistics managers require for proper management of game populations. The improved big game harvest data resulting from this study have already proved useful in a management context. During summer 1998, returns of both chinook and chum salmon to the Yukon River and its tributaries were unexpectedly low. In several localities, poor salmon returns combined with adverse weather conditions to severely disrupt fishing effort resulting in critically low subsistence harvests of salmon. These subsistence food shortages prompted several middle Yukon and Koyukuk River communities to seek disaster relief from the state in the form of emergency moose season openings. In responding to these requests, ADF&G staff and the Board of Game examined a variety of biological and harvest data. Survey data from this study provided relevant information on the subsistence uses of big game in affected areas. In particular, survey data provided information on where specific communities typically harvest moose and where hunting could be expected to be concentrated if emergency moose seasons were provided. Ultimately, these data contributed to the decision to allow early moose season openings in portions of GMUs 24 and 21D providing hunters in those areas with increased hunting opportunity to meet subsistence needs.

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1998 MIDDLE YUKON / KOYUKUK RIVER LARGE MAMMAL HARVEST SURVEY

HOW MANY PEOPLE LIVED IN THE HOUSEHOLD THIS PAST YEAR? _____ ARE ANY MEMBERS OF THIS HOUSEHOLD ALASKA NATIVE? YES NO

MOOSE

1 DID MEMBERS OF YOUR HOUSEHOLD USE OR HUNT MOOSE THIS PAST YEAR (BETWEEN APRIL 1997 AND MARCH 1998?) YES NO
IF YES, PLEASE COMPLETE THE FOLLOWING SECTIONS.

2 DURING THIS PAST YEAR, DID MEMBERS OF YOUR HOUSEHOLD:

USE Moose? YES NO HUNT Moose? YES NO HARVEST Moose? YES NO RECEIVE Moose? YES NO GIVE Moose? YES NO

3 HOW MANY MEMBERS OF THIS HOUSEHOLD HUNTED MOOSE IN THE LAST 12 MONTHS?_____

4 HOW MANY MOOSE WERE HARVESTED LAST YEAR BY MEMBERS OF THIS HOUSEHOLD?_____

MOOSE

			1997									1998				
M	LOCATION (UCU)	M or F	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	UNK	Potlatch*
1																
2																
3																
4																
5																

CARIBOU

1 DID MEMBERS OF YOUR HOUSEHOLD USE OR HUNT CARIBOU THIS PAST YEAR (BETWEEN APRIL 1997 AND MARCH 1998?) YES NO
IF YES, PLEASE COMPLETE THE FOLLOWING SECTIONS.

2 DURING THIS PAST YEAR, DID MEMBERS OF YOUR HOUSEHOLD:

USE Caribou? YES NO HUNT Caribou? YES NO HARVEST Caribou? YES NO RECEIVE Caribou? YES NO GIVE Caribou? YES NO

3 HOW MANY MEMBERS OF THIS HOUSEHOLD HUNTED CARIBIOU IN THE LAST 12 MONTHS?_____

4 HOW MANY CARIBOU WERE HARVESTED LAST YEAR BY MEMBERS OF THIS HOUSEHOLD?_____

CARIBOU

C	LOCATION (UCU)	M or F	Month	Potlatch*
1				
2				
3				
4				
5				

CARIBOU

C	LOCATION (UCU)	M or F	Month	Potlatch*
6				
7				
8				
9				
10				

Division of Subsistence, AK Dept. of Fish and Game,
1300 College Rd., Fairbanks, AK 99701-1599

COMMUNITY: KALTAG (179) HHID _____ Interviewers Initials _____ Date _____

1998 MIDDLE YUKON / KOYUKUK RIVER LARGE MAMMAL HARVEST SURVEY

BLACK BEAR

1 DID MEMBERS OF YOUR HOUSEHOLD USE OR HUNT BLACK BEAR THIS PAST YEAR (BETWEEN APRIL 1997 AND MARCH 1998?) YES NO

IF YES, PLEASE COMPLETE THE FOLLOWING SECTIONS.

2 DURING THIS PAST YEAR, DID MEMBERS OF YOUR HOUSEHOLD:

USE Black Bear? YES NO HUNT Black Bear? YES NO HARVEST Black Bear? YES NO RECEIVE Black Bear? YES NO GIVE Black Bear? YES NO

3 HOW MANY MEMBERS OF THIS HOUSEHOLD HUNTED BLACK BEAR IN THE LAST 12 MONTHS?_____

4 HOW MANY BLACK BEAR WERE HARVESTED LAST YEAR BY MEMBERS OF THIS HOUSEHOLD?_____

5 WHAT PARTS OF THE BEAR DID YOU USE? Hide _____ Meat _____ Fat _____

BLACK BEAR			1997									1998				
BL	LOCATION (UCU)	M or F	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	UNK	Potlatch*
1																
2																
3																
4																
5																

BROWN BEAR

1 DID MEMBERS OF YOUR HOUSEHOLD USE OR HUNT BROWN BEAR THIS PAST YEAR (BETWEEN APRIL 1997 AND MARCH 1998?) YES NO

IF YES, PLEASE COMPLETE THE FOLLOWING SECTIONS.

2 DURING THIS PAST YEAR, DID MEMBERS OF YOUR HOUSEHOLD:

USE Brown bear? YES NO HUNT Brown Bear? YES NO HARVEST Brown Bear? YES NO RECEIVE Brown Bear? YES NO GIVE Brown Bear? YES NO

3 HOW MANY MEMBERS OF THIS HOUSEHOLD HUNTED BROWN BEAR IN THE LAST 12 MONTHS?_____

4 HOW MANY BROWN BEAR WERE HARVESTED LAST YEAR BY MEMBERS OF THIS HOUSEHOLD?_____

5 WHAT PARTS OF THE BEAR DID YOU USE? Hide _____ Meat _____ Fat _____

BROWN BEAR			1997									1998				
BR	LOCATION (UCU)	M or F	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	UNK	Potlatch*
1																
2																

***POTLATCH ANIMALS**

IF ANY MOOSE, CARIBOU, OR BEARS WERE TAKEN SPECIFICALLY FOR A POTLATCH, PLEASE INDICATE WITH A STAR * IN THE HARVEST TABLE.

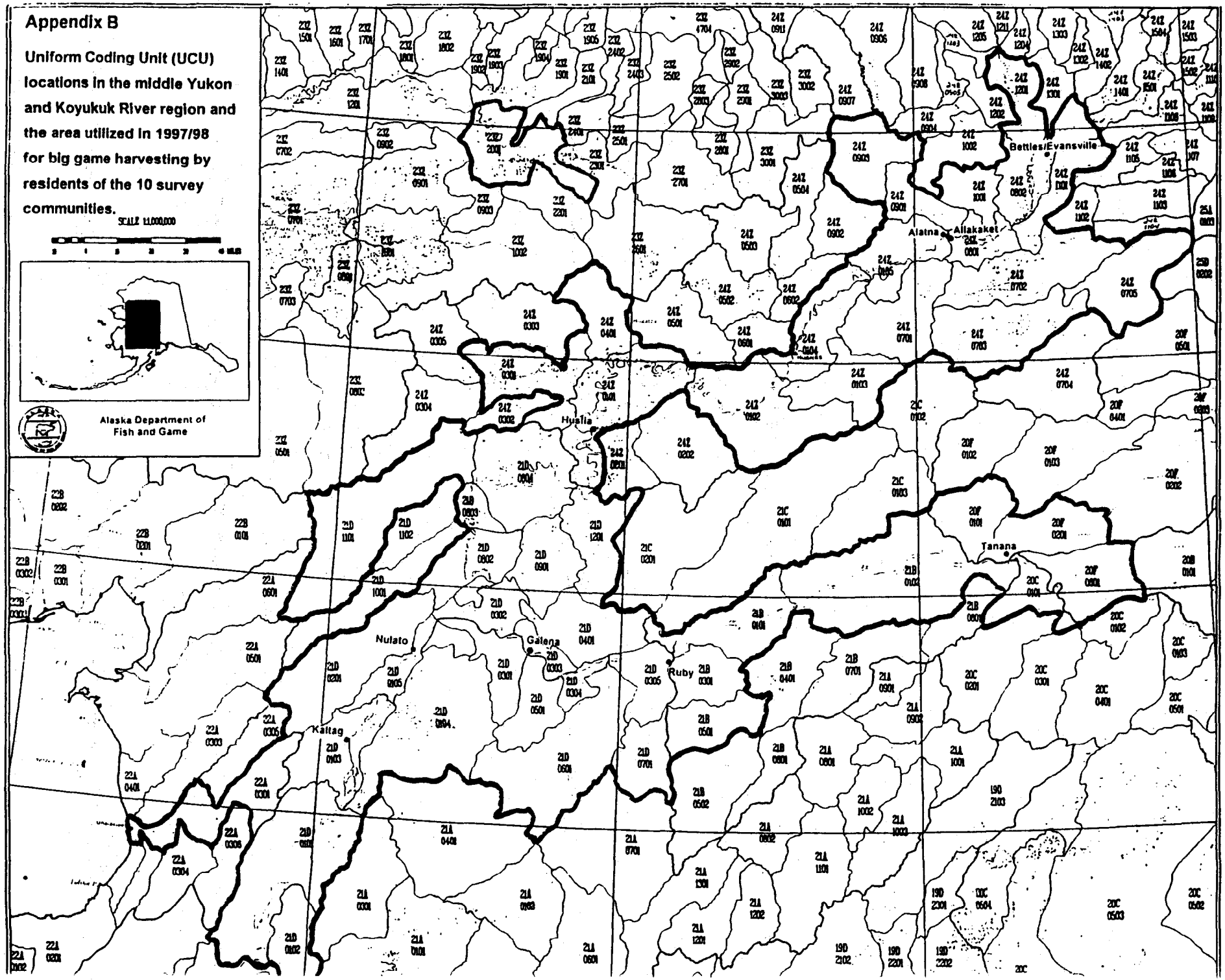
IF NO ANIMALS WERE TAKEN FOR POTLATCH PURPOSES, PLEASE CHECK HERE: _____

THANK YOU VERY MUCH!

DO YOU HAVE ANY COMMENTS ABOUT WILDLIFE RESOURCES IN THIS AREA?

Appendix B

Uniform Coding Unit (UCU) locations in the middle Yukon and Koyukuk River region and the area utilized in 1997/98 for big game harvesting by residents of the 10 survey communities.



APPENDIX C

HUNTING REGULATIONS PERTAINING TO BIG GAME IN THE MIDDLE YUKON-KOYUKUK RIVER AREA

During the survey period (April 1997 – March 1998) local residents hunted under state and federal subsistence hunting regulations that varied somewhat by game management subunits and according to land ownership. In general, regulations for big game in the middle Yukon-Koyukuk River area are some of the least restrictive in the state, offering liberal seasons, often for either sex and with waived reporting or sealing requirements for local residents. State and federal seasons and bag limits for big game across the survey area were fairly similar, with major differences noted below.

Moose

Moose hunters from survey communities harvested moose in six game management units/ subunits: 20C, 20F, 21A, 21B, 21D, and 24. While season opening and closure dates varied slightly across these units, all six offered hunting opportunities for bull moose during the month of September. Under federal regulations, federal lands in some areas of GMU 24 were open to moose hunting earlier than state lands and offered local residents opportunities to hunt bull moose during the last week of August. A November bulls-only season for moose was available to hunters in 21A and a December season for bulls-only was offered in a portion of unit 20F under state regulations. In addition to these bulls-only seasons, units 21D and 24, where 85 percent of the harvest by survey communities took place, also had open seasons for moose of either sex. Unit 21D offered short open seasons for moose of either sex in September and February while unit 24 offered open seasons for moose of either sex in September, December, and March. In all units the individual bag limit was 1 moose per hunter per regulatory year. All moose hunters were required to obtain and carry a harvest ticket or a registration permit with them in the field, and were required to return the accompanying harvest report.

Caribou

Hunters from survey communities harvested caribou in portions of GMUs 21D, 22A, 23 and 24. During the survey period, seasons for caribou in these areas were open year-round, with a bag limit of 5 caribou per day. Federal lands in GMU 23 had an increased bag limit of 15 caribou per day for qualified local residents under federal regulations and may account for a number of Galena caribou hunters that traveled to unspecified locations in GMU 23. Throughout the area hunted by residents of survey communities, caribou of either sex could be taken except during the period May 16 to June 30, when the harvest was restricted to bulls. Harvest tickets and reports were not required for those living and hunting north of the Yukon River, which included all of the successful caribou hunters surveyed. Instead, caribou hunters were required to register with ADF&G or an authorized license vendor within the area and received a mail-in harvest questionnaire from ADF&G.

Black Bear

Throughout the study area the season for black bear during the study period is open year-round with a bag limit of 3 bears of either sex. For resident hunters, no permits, harvest tickets, or tags were required for black bear. While sealing was not required over most of the study area, the hides and skulls of black bears taken in GMU 20, including 20F utilized by hunters from Tanana, were required to be sealed by a designated sealing officer.

Brown Bear

While no harvests of brown bear were reported during the survey period, the legal hunting season for brown bear in the area being utilized by the survey communities for other big game harvest activities was September 1 through May 31. The legal bag limit was one bear of either sex every four regulatory years in GMUs 20F 20C, 21B, and 21C, and the hides and skulls of

bears taken in these areas were required to be sealed by a designated sealing officer. The remainder of the area (GMUs 21D, 22A, 23, and 24) falls within the Northwest Alaska Brown Bear Management Area, where, for subsistence purposes, resident hunters are allowed to take one bear of either sex per regulatory year and there is no sealing requirement for bears retained within the management area. Under these regulations, no aircraft may be used to transport hunters and brown bear meat must be saved for human consumption.